

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-105345  
 (43)Date of publication of application : 11.04.2000

(51)Int.CI. G02B 26/08  
 F15B 21/06  
 G09F 9/37

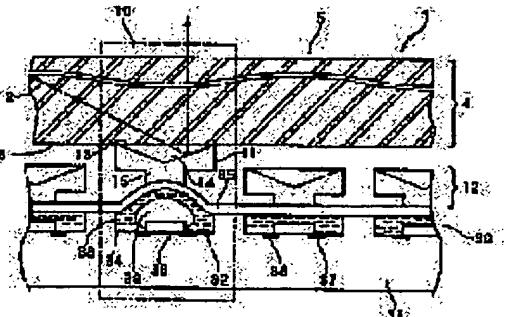
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## (54) ACTUATOR, OPTICAL SWITCHING ELEMENT, AND PICTURE DISPLAY DEVICE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a simply structured actuator used as a driving source of an optical switching element capable of operating at a speed higher than that of a liquid crystal.

**SOLUTION:** An operation space 32 capable of almost sealing up an operation liquid 33 is arranged, so that the operation liquid 33 can partially be warmed with a heater 36 in contact with the operation liquid 33. In this actuator 30, the operation liquid 33 is heated up and forms an air bubble 39 to raise the inner pressure, therefore, a displaceable thin film 35 is displaced upward to drive a switching part 11. Therefore, it is possible to provide a switching element 10 capable of operating at a high speed with a simple structure.



[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

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